

REMARKS

The Office Action mailed May 18, 2007, has been carefully considered. The present Amendment is intended to be a complete response thereto and to place the case in condition for allowance.

Claims 1-25 are pending. Claims 1-18 have been withdrawn from consideration by the Examiner as being drawn to non-elected inventions. Claim 19 has been amended to recite that the temperature measured is for “only the small volume.” Support for the amendment is found, *inter alia*, in the specification on page 8, lines 17-19.

Applicants gratefully acknowledge the courtesy of a personal interview conducted on October 17, 2007, where the Examiner Jagan and Applicants’ representative, Minh-Quan K. Pham, discussed the invention and outstanding rejection. It was agreed during the interview that an amendment to the claims to recite that “only the temperature of the small volume is measured” would overcome the outstanding rejection.

THE CLAIMS ARE NOT OBVIOUS

Claims 19-24 stand rejected under 35 U.S.C. §103(a) as being obvious over Landers et al. (U.S. Patent No. 6,210,882) in view of Murphy et al. (U.S. Patent No. 5,381,229). Applicant respectfully traverses the rejection.

The cited references, taken alone or in combination, fail to disclose every element of the claimed invention. In particular, the references fail to disclose measuring the temperature of a sample in a closed reservoir with an optical interferometric sensor, as recited by claim 19.

Contrary to the present invention, Landers et al. disclose using a thermo-optical sensing device to

measure the temperature of the liquid surface of an “open reaction vessel.” In column 15, lines 40-44, Landers et al. specifically states:

a thermo-optical sensing device can be placed above an open reaction vessel containing the sample being thermocycled. Such a device can sense the temperature on a surface, here the surface of the sample, when positioned remotely from the sample.

(emphasis added). This teaching is clearly in agreement with the teaching of Murphy et al.

which discloses an optical interferometer for measuring change in temperature of a surface. *See, e.g.* FIG. 3 and column 5, lines 35-45.

Contrary to the teaching of Landers et al., the present invention measures the temperature of a sample in a closed reservoir. This involves placing the interferometric sensor on a cover plate covering the closed reservoir. If this closed reservoir is used in accordance with the method of Landers et al. and Murphy et al., the sensor merely measures the temperature of the cover plate, and not the temperature of the sample inside the closed reservoir, under the cover plate. To obtain the temperature of the sample inside the closed reservoir, it is necessary to resolve light reflections from the cover plate, the sample inside the sample, and the bottom of the reservoir. That is not taught, suggested, or contemplated by the prior art.

The difficulty of measuring the temperature of a sample inside a closed reservoir is recognized by Landers et al., which is exactly why they specifically teach an “open reaction vessel” and measuring the temperature on “the surface of the sample.” Accordingly, one of ordinary skill in the art reading the disclosure of Landers et al. would not have used a thermo-optical sensing device to measure the temperature of a sample in a closed reservoir, because Landers et al. taught away from this application.

Likewise, Murphy et al. also teaches an optical interferometer for measuring temperature of surfaces, specifically disclosing:

The light is partially reflected at the sapphire/air interface, and the transmitted light beyond this interface is reflected from a surface of interest. The first reflection, that is the reflection from the sapphire/air interface, is the reference beam while the phase of the second reflection produces optical fringes at the output of a detector coupled to the silica optical fiber via an opto-coupler. The optical fringes are related to changes in optical path length. Such changes in optical path length may be due to displacements of the surface which, in turn, can provide an indirect measurement of pressure, strain, acoustic waves, or temperature of the surface.

Murphy et al., column 3, line 64, to column 4, line 8 (emphasis added). Therefore, because both Landers et al. and Murphy et al. teach measuring temperature of a surface, the combination of the references does not result in the present invention, which measures temperature of a sample in a closed reservoir, under a cover plate. The combination of the cited references would not have resulted in the temperature measurement of a sample in a closed reservoir, but rather an open reservoir, as discussed above. If a cover plate is placed on the reservoir, as that of the present invention, the combination of the cited references would only result in measuring the surface temperature of the cover plate, not the temperature of the sample beneath the cover plate.

In the Office Action, the Examiner alleges that Landers et al. disclose a closed reservoir. However, there is no disclosure of the use of a remote temperature sensor with that closed reservoir. Landers et al. only disclose the use of the remote temperature sensor with an open container. *See* column 15, lines, 37-44. Additionally, Landers et al. also disclose “a thermo-optical sensing device 178” that is used with an open container. *See* column 16, lines 59-63; and Figures 6C and 6D. If one is to apply the sensor of Murphy et al. with the closed container of Landers et al., the sensor would measure only the surface temperature of the walls of the container enclosing the sample, not the temperature of the sample enclosed within the container. As such, the combination does not result in the presently claimed invention.

Therefore, for the reasons cited, the combination of Landers et al. and Murphy et al. does not render the claims of the present invention obvious. Accordingly, Applicants respectfully request withdrawal of the rejection.

CONCLUSION

Applicant have responded to the Final Office Action mailed May 18, 2007. A Petition for a two-month extension of time, and fee therefor are filed herewith. All pending claims are now believed to be allowable and favorable action is respectfully requested.


In the event that there are any questions relating to this Amendment or to the application in general, it would be appreciated if the examiner would telephone the undersigned attorney concerning such questions so that the prosecution of this application may be expedited.

Please charge any shortage or credit any overpayment of fees to BLANK ROME LLP, Deposit Account No. 23-2185 (119620-00101). In the event that a petition for an extension of time is required to be submitted herewith and in the event that a separate petition does not accompany this response, applicant hereby petitions under 37 C.F.R. 1.136(a) for an extension of time for as many months as are required to render this submission timely.

Any fees due are authorized above.

Respectfully submitted,

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